ABSTRACT

In a multi-mode interference waveguide (MMI) of a sheet shape spreading in the length direction and the width direction, the length of the multi-mode interference waveguide is set to such a length that the unique mode interferes in the length direction, thereby reducing the coupling loss when inputting/outputting the signal light. The multi-mode interference waveguide has a maximum refraction factor portion in the thickness direction and has such a refraction factor distribution that the refraction factor is reduced as departing from the maximum refraction factor portion. Thus, it is possible to suppress mode dispersion in the thickness direction of the multi-mode interference waveguide and obtain a high transmission rate in the order of 10 Gb/s.